

Lyman B. Smith

COLOMBIA

PITCAIRNIA VOLUBILIS L. B. Smith, sp. nov.

P. laxissima Baker in systema Mezii proxima sed petioliis brevibus spinoso-serratis, laminis foliorum ellipticis, pedicellis sepalisque multo minoribus differt.

Epiphytic, climbing; stem over a meter long, 5 mm. in diameter, covered by the leaf-sheaths; leaves dimorphic, some with broad blades, others bladeless with the petiole modified into a slender serrate spine; leaf-sheaths uniform, suborbicular, 1 cm. long, dark castaneous except for the green apex and margins, sparsely pale-lepidote, pectinate-serrate near the apex, entire below; petioles 5 cm. long, 5 mm. wide, channeled, the lower half laxly serrate with slender black spines 1.5 mm. long; blades elliptic, acuminate at both ends, 15 cm. long, 45 mm. wide, entire, mottled with dark green, sparsely white-flocculose, soon glabrous; scape elongate, slender, soon glabrous; scape-bracts erect, all but the highest exceeding the internodes, the lower ones like the leaf-blades, the upper lance-ovate and much smaller; inflorescence erect, simple, laxly many-flowered, 35 cm. long, finely white-floccose; floral bracts lance-ovate, acuminate, much shorter than the pedicels; pedicels spreading, slender, 20 mm. long; sepals narrowly triangular, abruptly acute, 25 mm. long, ecarinate; petals 10 cm. long, white, naked; ovary slenderly fusiform, $\frac{4}{5}$ superior, ovules caudate. Fl. I, fig. 1: Complete leaf x $\frac{1}{2}$; fig. 2: Reduced leaf x $\frac{1}{2}$; fig. 3: Flower x $\frac{1}{2}$; fig. 4: Sepal x 1.

Type in the U. S. National Herbarium, No. 2,057,913, collected on trees at Las Mesas, Territory of Putumayo, Colombia, November 22, 1946, (bloomed in cultivation June 21, 1952), by M. B. and R. Foster (No. 2229).

PUYA CUATRECASASII L. B. Smith, sp. nov.

A *P. trianae* Baker, cui affinis, laminis foliorum latioribus, inflorescentia valde clavato-strobiliforme, bipinnata, bracteis florigeris patentibus vel paulo reflexis ex sicco aterrimis, floribus fasciculatis differt.

Rhizome epigeaeus, much branched; flowering plant 1 m. high; leaves 26 cm. long, the sheaths suborbicular, serrulate toward the apex, the blades narrowly triangular, straight, flat, acuminate, pungent, above even, glabrous, and lustrous, beneath obscurely brown-lepidote, coarsely cinereous-lepidote along the margins, laxly serrate with ascending nearly straight dark slender spines 6 mm. long; scape erect, about 13 mm. in diameter; scape-bracts strict, densely imbricate, the lower foliaceous but narrow, the upper with suborbicular entire membranaceous nearly black sheaths and short serrulate blades; inflorescence clavate-strobiliform, 9 cm. in diameter, bipinnate, densely and coarsely

ferruginous-lanate; primary bracts like the upper scape-bracts but with nearly or quite entire apices, spreading at anthesis and revealing the flowers, the extreme apex more or less reflexed; branches reduced to few-flowered pulvini; floral bracts suborbicular, exceeding the sepals, entire, membranaceous, dark; pedicels very short and stout; sepals lance-oblong, acute, 24 mm. long; petals 5 cm. long, obtuse, cream-white. Fl. I, fig. 5: Habit from photograph; fig. 6: Leaf-apex x 1; fig. 7: Primary bract x 1; fig. 8: Floral bract and flower x 1; fig. 9: Sepal x 1.

Type in the Chicago Natural History Museum, collected on páramo, Alto de Las Casitas, sources of the Río Palo, western slope of the Cordillera Central, Department of Cauca, Colombia, altitude 3,800 meters, December 3, 1944, by J. Cuatrecasas (No. 18962).

COLOMBIA: CAUCA: Río Vinagre, Puracé, alt. 3,800 m., Sept. 1936, Dryander 1850 (US).

PUYA FURFURACEA (Willd.) L. B. Smith, comb. nov.

Pitcairnia furfuracea Willd. Enum. 1: 346. 1809.

Pourretia pyramidata sensu H.B.K. Nov. Gen. & Sp. 1: 296. 1815. not R. & P. 1802.

Puya bonplandiana Schult. in R. & S. Syst. 7: 1236. 1830.

PUYA LEHMANIANNA L. B. Smith, nom. nov.

Pitcairnia pastoensis Baker, Handb. Bromel. 122. 1889.

Puya pastoensis Mez in DC. Monogr. Phan. 9: 483. 1896, non P. pastensis André. 1888.

PUYA OCCIDENTALIS L. B. Smith, sp. nov.

A P. santanderense Cuatrecasas, foliis majoribus, subtus solum inter nervos lepidotis, spinis foliorum majoribus densioribus, sepalis multo latioribus differt.

Flowering plant 6 - 8 dm. high; leaves densely rosulate, 35-50 cm. long, the sheaths suborbicular, 5 cm. long, the blades narrowly triangular, acuminate, pungent, 25 mm. wide, glabrous and lustrous above, minutely cinereous-lepidote between the nerves beneath; scape 15 mm. in diameter, soon glabrous; scape-bracts broadly ovate with foliaceous blades, membranaceous, nearly black when dry, fragile and soon disintegrating; inflorescence strobiliform; densely and finely white-lanate; primary bracts erect, broadly ovate with a triangular apex, 10 cm. long, entire, nearly black, membranaceous; branches aborted, one-several-flowered; floral bracts broadly ovate, acute, exceeding the sepals; pedicels short and stout; sepals lance-ovate, acute, to 30 mm. long, 13 mm. wide, membranaceous. Fl. II, fig. 1: Leaf-apex x 1; fig. 2: Primary bract and branch x 1; fig. 3: Sepal x 1.

Type in the U. S. National Herbarium, No. 1,989,514, collected at Los Farallones, crest of the Cordillera Occidental, between La Torre and Alto del Busy, Department of El Valle, Colombia, altitude 3,400-3,550 meters, August, 1946, by J. Cuatrecasas (No. 21905). Duplicate in the Chicago Natural History Museum.

Plate I

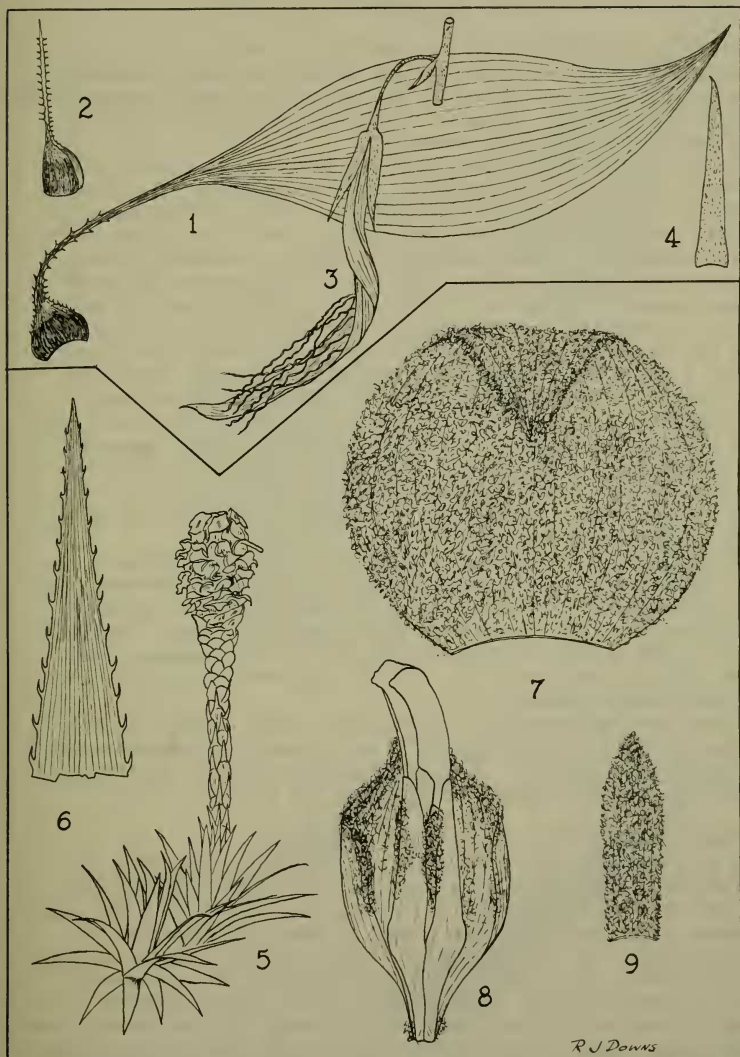


Fig. 1-4: *Pitcairnia volubilis*; fig. 5-9: *Puya cuatrecasasii*.

EL VALLE: Páramos, Los Farallones, crest of the Cordillera Occidental, northern end of range of Alto del Buey, alt. 3,500-3,600 m., Oct. 11, 1944, Cuatrecasas 17919 (FM).

TILLANDSIA CUATRECASASII L. B. Smith, sp. nov.

Acaulis; foliis acuminatis; inflorescentia dense bipinnatim paniculata; bracteis primariis infimis spicas paulo superantibus; bracteis florigeris carinatis, sepala superantibus; sepalis lepidotis, posticis alte connatis.

Epiphytic, stemless, the flowering plant about 1 meter high; leaves to 57 cm. long, densely appressed-lepidote; the sheaths nearly as long as the blades, elliptic, ample, ferruginous; the blades narrowly triangular, acuminate, flat, 45 mm. wide at the base, cinereous; scape elongate, straight or slightly curved; scape-bracts subfoliaceous, very densely imbricate; inflorescence densely bipinnate, 2-3 dm. long; primary bracts broadly ovate, acuminate, densely lepidote, the lowest slightly exceeding the spikes; spikes suberect, lanceolate, acute, to 13 cm. long, 3 cm. wide; floral bracts densely imbricate, exceeding the sepals, broadly elliptic, not incurved toward the apex, strongly carinate, coriaceous, even, red, densely lepidote near the apex; sepals lanceolate, acute, to 28 mm. long, sparsely lepidote, the posterior ones high-connate; petals violet (! Cuatrecasas), exceeding the stamens and pistil. Pl. II, fig. 4: Leaf-apex x 1/2; fig. 5: Primary bract and spike x 1/2; fig. 6: Posterior sepals x 1.

Type in the U. S. National Herbarium No. 1,951,296 and 1,951,297, collected between Barragán on the Río Bugalagrande and Corrales on the Páramo de Bavaya, western slope of the Cordillera Central, Department of El Valle, Colombia, altitude 3,400-3,550 meters, April 11, 1946, by J. Cuatrecasas (No. 20599). Duplicates at the Gray Herbarium and the Chicago Natural History Museum.

Its large lepidote floral bracts and sepals readily distinguish *Tillandsia cuatrecasasii* from its nearest relatives such as *T. schimperiana* Mez, *T. confertiflora* André, *T. restrepoana* André, *T. caloura* Harms, and *T. pastensis* André.

TILLANDSIA DELICATULA L. B. Smith, sp. nov.

A *T. singularis* Mez & Wercklé, cui affinis, inflorescentia tripinnata, graciliter thyrsoidea, floribus minoribus differt.

Stemless, flowering shoot to 65 cm. high; leaves 4-5 dm. long; sheaths large, elliptic, very dark at base, covered with a glaucous coat of thin appressed whitish scales; blades ligulate, flat, broadly retuse and apiculate, 3-4 cm. wide, subdensely pale-lepidote beneath, soon glabrous above; scape slender, erect, glabrous; scape-bracts strict, except for the acute divergent apex, elliptic, all but the lowest imbricate, thin; inflorescence tripinnate except near the apex, slenderly thyrsoid, 3 dm. long, glabrous; primary bracts lanceolate, acuminate, shorter than the branches, red; branches suberect, to 75 mm. long, consisting of a short naked base and 1-3 spikes; secondary

Plate II

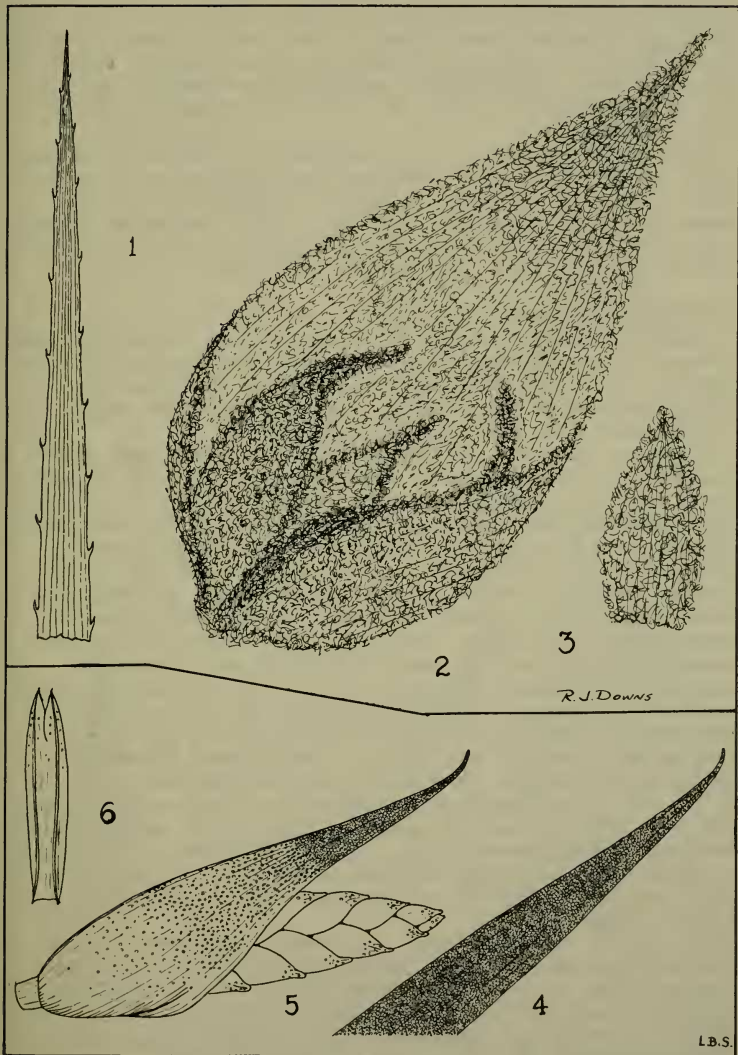


Fig. 1-3: *Puya occidentalis*; fig. 4-6: *Tillandsia cuatrecasasii*.

bracts but slightly larger than the floral bracts; spikes laxly 8-flowered; rhachis slender, flexuous; floral bracts ovate, acute, equaling the sepals or slightly shorter, sharply carinate, thin, prominently nerved, red; pedicels 2 mm. long; flowers spreading; sepals elliptic, broadly obtuse; 8 mm. long, nerved, subequally short-connate; petals yellow, exceeding the stamens. Pl. III, fig. 1: Leaf-apex x 1; fig. 2: Primary bract and branch x 1; fig. 3: Flower x 1.

Type in the herbarium of the Comisión de Botánica de la Secretaría de Agricultura y Fomento del Departamento del Valle del Cauca, collected in woods, La Laguna, left bank of the Río Sanquiniá, western slope of the Cordillera Occidental, Department of El Valle, Colombia, altitude 1,250-1,400 meters, December 10-20, 1943, by J. Cuatrecasas (No. 15647).

TILLANDSIA ORBICULARIS L. B. Smith, sp. nov.

Acaulis; laminis foliorum subtriangularibus, acuminatis; scapi bracteis dense imbricatis, subfoliaceis; inflorescentia bipinnata, dense ellipsoidea; bracteis primariis orbicularibus, spicas inferiores superantibus; bracteis florigeris sepala superantibus; laevibus; sepalis fere liberis.

Epiphytic stemless, the flowering plant 65 cm. high; leaves numerous in a crateriform rosette, nearly 5 dm. long; sheaths large, elliptic, merging with the blades, dark purple; blades subtriangular with the margins slightly bowed, flat, acuminate, 5-6 cm. wide at base, subglabrous and green above, densely cinereous-lepidote beneath; scape erect; scape-bracts strict, densely imbricate, subfoliaceous; inflorescence slightly decurved, bipinnate, densely ellipsoid, 14 cm. long; primary bracts erect, imbricate, orbicular, even, glabrous, the lower exceeding the spikes and bearing long narrowly triangular lepidote red blades, the upper slightly shorter than the spikes and merely apiculate; spikes sessile and without sterile bracts at the base, suborbicular, 4-5-flowered, strongly complanate; floral bracts oblong-obovate, acute, incurved, exceeding the sepals, sharply carinate, coriaceous, even, red or yellow (! Cuatrecasas), appressed-lepidote toward the apex and soon glabrous outside, dark-lepidote inside; sepals oblong-obovate, broadly acute, 18 mm. long, nearly free, sparsely dark-lepidote, nerved; petals and stamens unknown. Pl. III, fig. 4: Leaf-apex x 1/2; fig. 5: Primary bract x 1; fig. 6: Spike x 1; fig. 7: Sepal x 1.

Type in the Gray Herbarium, collected in thickets and low forest of páramo, Alto del Duende, valley of the Río Lopez, headwaters of the Río Palo, western slope of the Cordillera Central, Department of Cauca, Colombia, altitude 3,300-3,350 meters, December 1-2, 1944, by J. Cuatrecasas (No. 18831). Duplicate at the Chicago Museum of Natural History.

COLOMBIA: EL VALLE: Epiphytic, páramos, extreme north of the Alto del Buey range, Los Farallones, crest of the Cordillera Occidental, alt. 3,500-3,600 m., Oct. 12, 1944, Cuatrecasas 17945 (GH).

Plate III

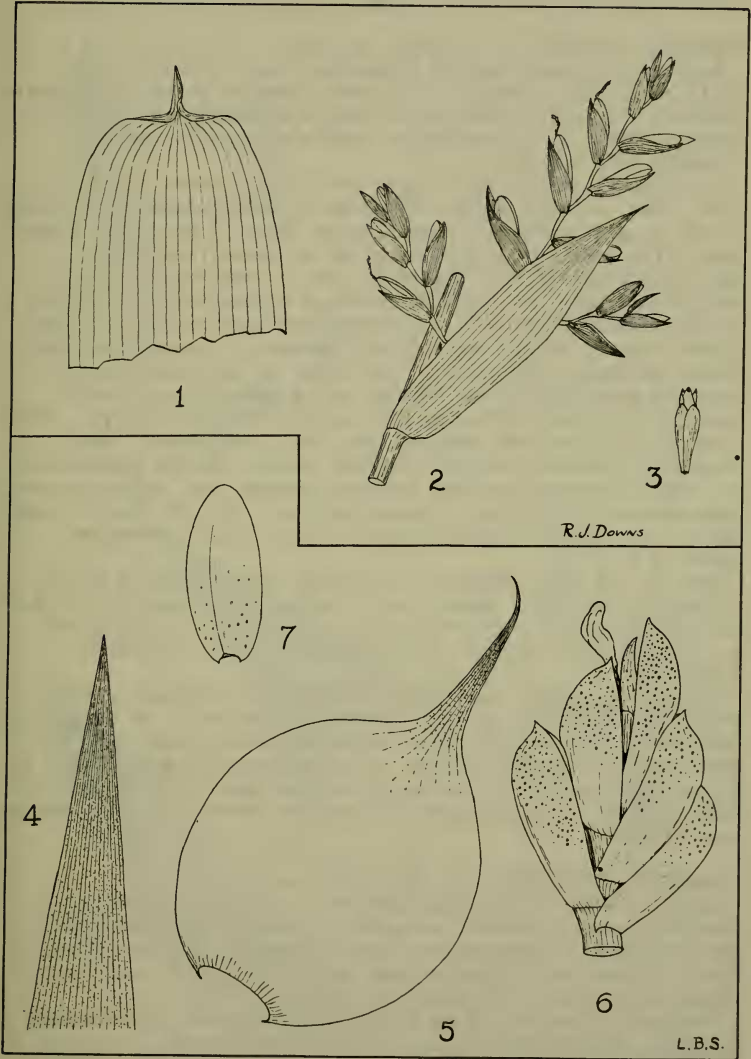


Fig. 1-3: *Tillandsia delicatula*; fig. 4-7: *T. orbicularis*.

Tillandsia orbicularis closely resembles T. wangerini Mez of Peru but differs in its even bracts which exceed the sepals.

TILLANDSIA REVERSA L. B. Smith, sp. nov.

Acaulis; foliorum laminis ligulatis; scapi bracteis haud foliaceis; inflorescentia bipinnata; bracteis primariis minimis; bracteis florigeris imbricatis, sepala superantibus; sepalis extus glabris, intus lepidotis, posticis connatis; petalis staminibusque ignotis.

Stemless, the flowering plant 4 dm. high; leaves numerous, 3 dm. long; sheaths ample, obscurely brown-lepidote, dark purple above; blades ligulate, broadly acute, flat, 5 cm. wide, green with a few small purple spots, glabrous above, sparsely appressed-lepidote beneath; scape erect; scape-bracts erect, imbricate, ovate, acute; inflorescence bipinnate, subdigitate; primary bracts broadly ovate, acute, scarcely larger than the floral bracts, ecarinate; spikes divergent, linear-lanceolate, acute, slightly complanate, 8 cm. long, 15 mm. wide, 10-flowered with 2-3 sterile bracts at the base; floral bracts densely imbricate, exceeding the sepals, broadly elliptic, acute with the extreme apex incurved, carinate, coriaceous, even, glabrous, orange (! Killip & Smith); sepals oblong, obtuse, 17 mm. long, glabrous outside, lepidote inside, the posterior ones high-connate; petals and stamens unknown. Pl. IV, fig. 1: Leaf-apex $\times 1/2$; fig. 2: Inflorescence $\times 1/2$; fig. 3: Posterior sepals $\times 1$.

Type in the Gray Herbarium, collected at the edge of woods, vicinity of La Baja, Department of Santander, Colombia, altitude 2,700-3,500 meters, January 14-31, 1927, by E. P. Killip and A. C. Smith (No. 18056). Duplicate in the U. S. National Herbarium.

Tillandsia reversa has scales on the inner surface of the sepals, a condition exactly opposite to that which is general in the genus. Although no petals or stamens have been seen, the species most probably belongs in the subgenus Allardtia next to T. carrieri André. It differs from that species in its short inflorescence, small primary bracts, and narrow scarcely complanate spikes.

TILLANDSIA STIPITATA L. B. Smith, sp. nov.

Acaulis; laminis foliorum ligulatis, acutis; inflorescentia pendula, dense bipinnata, elongata; bracteis primariis spicas aequantibus vel superantibus; spicis longe stipitatis, laxe 3-floris; bracteis florigeris quam sepalis subduplo brevioribus; sepalis truncatis, subaequaliter liberis.

Stemless; flowering plant 56 cm. long with the inflorescence extended; leaves numerous in a crateriform rosette, to 39 cm. long, obscurely brown-lepidote, suffused with purple, sheaths elliptic, large, blades ligulate, acute, flat, 45 mm. wide at the base; scape short, curved; scape-bracts erect, densely imbricate, foliaceous; inflorescence pendulous, densely bipinnate, slenderly fusiform, 27 cm. long; primary bracts erect,

Plate IV

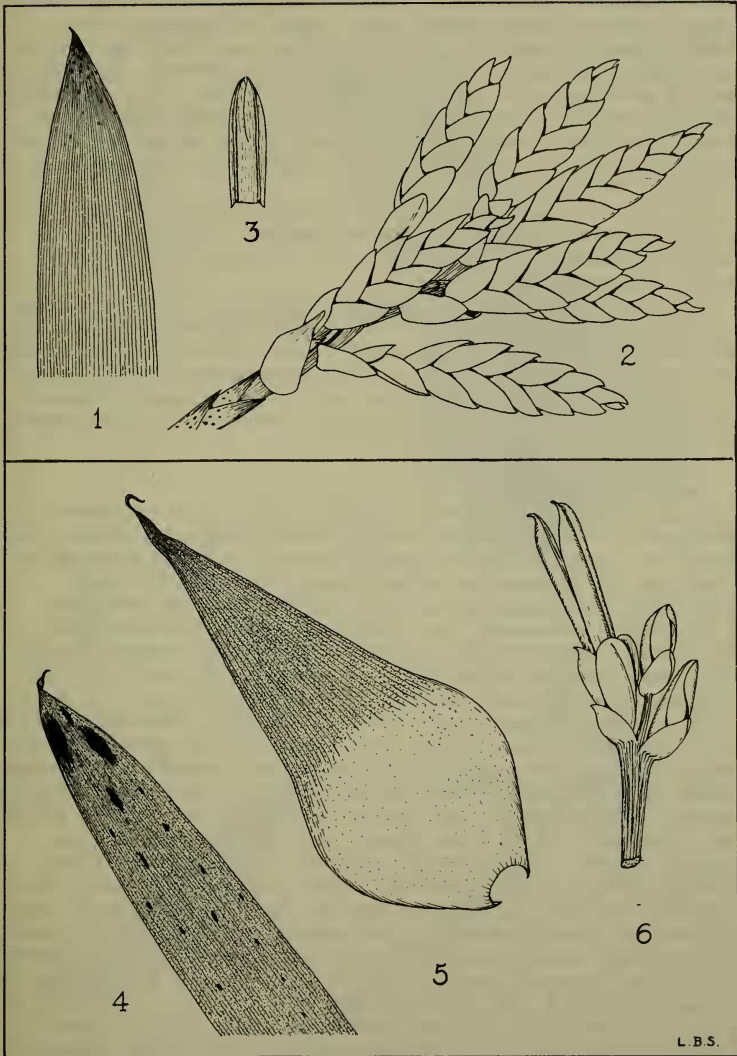


Fig. 1-3: *Tillandsia reversa*; fig. 4-6: *T. stipitata*.

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imbricate, suborbicular, equaling or exceeding the spikes, the lower ones with foliaceous blades, the upper apiculate; spikes with a long flattened naked stipe, laxly 3-flowered; floral bracts broadly ovate or elliptic, acute, about half as long as the sepals, carinate, thin but not strongly nerved, glabrous; sepals oblong-obovate, broadly truncate, 12 mm. long, carinate, even, sparsely and obscurely punctulate-lepidote; petals and stamens unknown; capsule slenderly cylindric, acuminate, 32 mm. long. Pl. IV, fig. 4: Leaf-apex $\times 1/2$; fig. 5: Primary bract $\times 1$; fig. 6: Spike $\times 1$.

Type in the Gray Herbarium, collected in forest between Paletará and Calaguala, Cordillera Central, Department of El Cauca, Colombia, altitude 3,000-3,200 meters, June 17, 1922, by F. W. Pennell (No. 7099).

Its size would place Tillandsia stipitata in the vicinity of T. violascens Mez in the key in the Pflanzenreich, but its long-stipitate spikes and small floral bracts indicate a much stronger affinity with T. biflora R. & P., from which it differs in its long pendulous inflorescence and broadly truncate sepals. In fact the form of the sepals approaches that which is general in the subgenus Pseudo-Catopsis.

VRIESIA KILLIPIANA L. B. Smith, sp. nov.

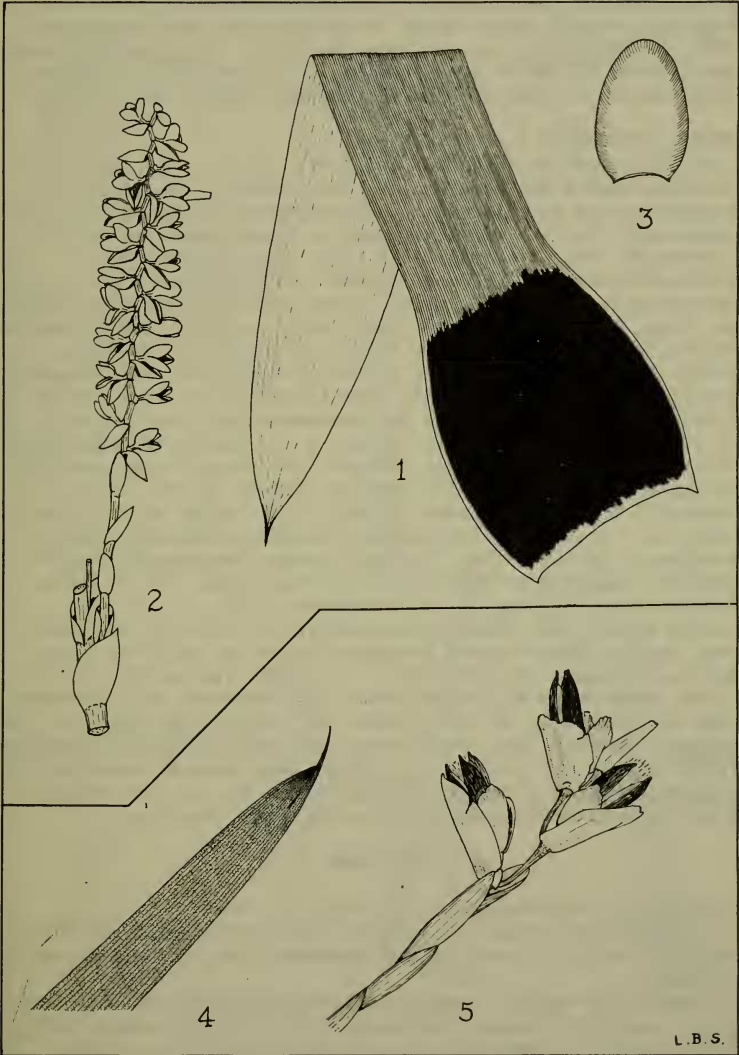
Acaulis; laminis foliorum ligulatis, acutis et cuspidato-acuminatis; scapo robusto; inflorescentia ample bipinnata, ramis strictis elongatis, valde prophylligeris, bracteis florigeris haud vel vix imbricatis, sepala subaequantibus, vel paulo brevioribus, ecarinatis, coriaceis; floribus haud secundis.

Epiphytic, stemless, the flowering plant 1.2 meters high (! Killip & Cuatrecasas); leaves 6-8 dm. long, minutely brown-lepidote, sheaths large, elliptic, slightly broader than the blades, dark castaneous on the outside, blades ligulate, acute with a hard acuminate cusp, flat, 11 cm. wide, obscurely mottled with dark green; scape stout; scape-bracts imbricate, the lower subfoliaceous, the upper broadly ovate and apiculate; inflorescence much branched; primary bracts like the upper scape-bracts, several times shorter than the long sterile bases of the branches; branches strict, 4 dm. long, laxly prophyllate at base, many-flowered; axis slightly flexuous, stout, angled; floral bracts broadly ovate, inflated, ecarinate, to 3 cm. long, from equaling to slightly shorter than the sepals, coriaceous, even, glabrous; flowers spreading, not secund; pedicels stout, about 1 cm. long; sepals elliptic, 17 mm. long, ecarinate, coriaceous; petals and stamens unknown. Pl. V, fig. 1: Leaf $\times 1/5$; fig. 2: Lateral branch $\times 1/5$; fig. 3: Sepal $\times 1$.

Type in the U. S. National Herbarium. No. 1,856,636 and 1,856,637, collected in mangrove swamp, Punta Arenas, north shore of Buenaventura Bay, Department of El Valle, Colombia, near sea level, June 2, 1944, by E. P. Killip and J. Cuatrecasas (No. 38619). Duplicate in the Gray Herbarium.

Although its flowers are not secund, Vriesia killipiana resembles V. sanguinolenta Cogn. & Marchal more closely than it

Plate V



L. B. S.

Fig. 1-3: *Vriesia killipiana*; fig. 4, 5: *V. verrucosa*.

does any other Colombian or Central American species. The similarity between the two in their primary bracts and long strict strongly prophyllate branches is particularly striking. However, V. killipiana can not be a phase of V. sanguinolenta where the flowers failed to turn, because it differs sharply in its dark castaneous leaf-sheaths and lax ecarinate floral bracts.

VERESIA VERRUCOSA L. B. Smith, sp. nov.

Acanthis; laminis foliorum ligulatis, angustis, acutis et mucronem longum debilem auctis; scapi bracteais imbricatis; inflorescentia simplicissima; axi verrucoso; bracteais florigeris rugulosis; floribus secundis; sepalis latis, ecarinatis.

Stemless, the flowering plant 4 dm. high; leaves few, subfasciculate, 25 cm. long, sheaths elliptic, small and inconspicuous, blades ligulate, acute with a linear soft cusp 1 cm. long, flat, 2 cm. wide, green; scape erect, slender; scape-bracts imbricate and tightly enfolding the scape, elliptic, acute, thin, even, obscurely punctulate-lepidote; inflorescence simple, laxly 3-flowered with a sterile rudiment at apex; axis slender, flexuous, enlarged and verrucose below each node; floral bracts not imbricate, ovate, 3 cm. long, much exceeding the sepals, ecarinate, very obscurely lepidote, nerveless and rugulose when dry, probably somewhat fleshy in life; flowers secund (! Foster); pedicels obconic, 5 mm. long; sepals broadly elliptic, about 2 cm. long (only incomplete material seen), ecarinate, nerveless and rugulose; petals and stamens unknown; capsule slenderly ellipsoid, acute, 3 cm. long. Pl. V, fig. 4: Leaf-apex x 1/2; fig. 5: Inflorescence x 1/2.

Type in the Gray Herbarium, collected on trees at Las Mesas, near Pepino, Territory of Putumayo, Colombia, altitude 1,350 meters, November 22, 1946, by M. B. and R. Foster (No. 2224).

The combination of simple secund inflorescence and verrucose axis is found only in this species and in Vriesia ringens. V. ringens, however, has broad leaves and large imbricate acuminate floral bracts. In habit V. verrucosa more nearly resembles V. subsecunda Wittm., but its verrucose axis and lax and rugulose floral bracts distinguish it from the latter species.

ECUADOR

PITCAIRNIA HITCHCOCKIANA L. B. Smith, sp. nov.

P. densiflora Brongn. in systema Mezii proxima sed petiolis angustis, sepalis posterioribus alato-carinatis, petalis rubris differt.

Densely aggregated, nearly stemless; flowering shoot 5-6 dm. high; leaves distichous, persistent, 8 dm. long, entire, very sparsely white-flocculose, soon glabrous; sheaths narrowly ovate, 3-4 cm. long, brown; petioles about 1 cm. wide, strongly channeled; blades linear-lanceolate, filiform-acuminate, 25 mm. wide; scape 5 mm. in diameter; scape-bracts erect, foliaceous, densely imbricate; inflorescence simple, strobilate, slenderly ellipsoid, 10 cm. long, 3 cm. in diameter; floral bracts in

Plate VI

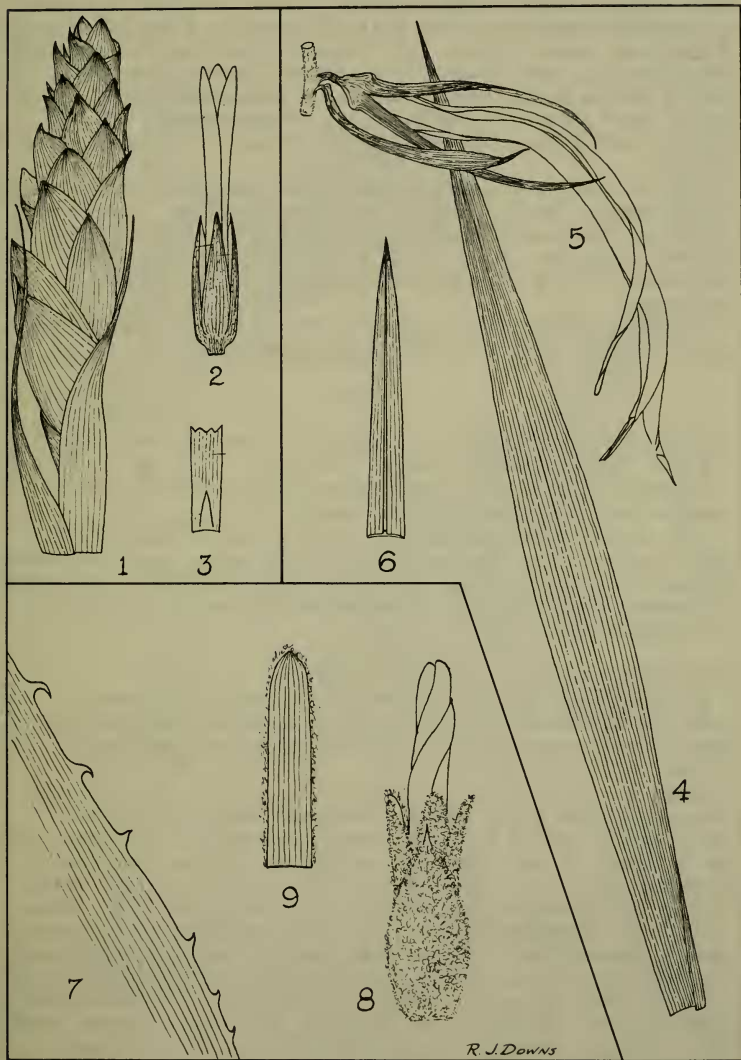


Fig. 1-3: *Pitcairnia hitchcockiana*; fig. 4-6: *P. lopezii*;
fig. 7-9: *Puya araneosa*.

about 4 or 5 ranks, closely imbricate, broadly elliptic, acute, 5 cm. long, scarlet, subcoriaceous, nerved when dry, finely flocculose toward the base; pedicels obconic, 2 mm. long; sepals lanceolate, acute, 19 mm. long, brown-flocculose, the anterior ecarinate, the posterior alate-carinate; petals 4 cm. long, red, with a narrow white margin, bearing a triangular scale at the base; ovary almost wholly superior; ovules caudate. Pl. VI, fig. 1: Inflorescence x 1/2; fig. 2: Flower x 1; fig. 3: Base of petal x 1.

Type in the New York Botanical Garden, collected in the valley of the Pastaza River, between Baños and Cashurco, 8 hours east of Baños, Province of Tungurahua, Ecuador, altitude 1,300-1,800 meters, September 25, 1923, by A. S. Hitchcock (No. 21816). Duplicates in the Gray Herbarium and the U. S. National Herbarium.

ECUADOR: TUNGURAHUA: On moist cliffs of Río Pastaza, 12 km. east of Baños, Feb. 15, 1953, Prescott 494 (NY).

PERU

PITCAIRNIA INERMIS Meyer var. FLAVA L. B. Smith, var. nov.

A var. inermis petalis flavis differt.

Flowering plant 8 dm. high; leaves serrulate below the abscission line; petals yellow, naked.

Type in the Museo de Historia Natural "Javier Prado," Lima, Peru, collected in tropical forest, at Cayumba, near Las Palmas, between Huánuco and Tingo María, Province of Huánuco, Department of Huánuco, Peru, altitude 800-900 meters, July 15, 1948, by R. Ferreyra (No. 4228).

PITCAIRNIA LOPEZII L. B. Smith, sp. nov.

P. schiedeana Baker in systema Mezii proxima sed scapi bracteis et bracteis florigeris haud subulato productis, pedicellis brevioribus, sepalis majoribus distincte carinatis differt.

About 1 m. high; leaves homomorphic, entire; bases (sketch) forming a large bulb; blades deciduous, linear-lanceolate, acuminate, slightly narrowed toward the base but not petiolate, 24 cm. long, 25 mm. wide, glabrous above, white-flocculose beneath; scape 8 mm. in diameter, red, white-floccose; scape-bracts erect, exceeding the internodes, the lower ones foliaceous with deciduous blades, the upper lanceolate, persistent membranaceous, red; inflorescence simple, lax, to 23 cm. long, its axis flocculose; floral bracts like the upper scape-bracts, to 4 cm. long, slightly exceeded by the sepals; flowers divergent; pedicels slender, 5-10 mm. long, white-flocculose; sepals very narrowly triangular, acuminate, 37 mm. long, carinate throughout, red, glabrous; petals naked, 8 cm. long, acute, yellow; anthers linear, 20 mm. long; ovary more than 3/4 superior, ovules caudate. Pl. VI, fig. 4: Deciduous leaf-blade x 1/2; fig. 5: Floral bract and flower x 1; fig. 6: Sepal x 1.

Type in the U. S. National Herbarium, No. 2,059,243, collected

Plate VII

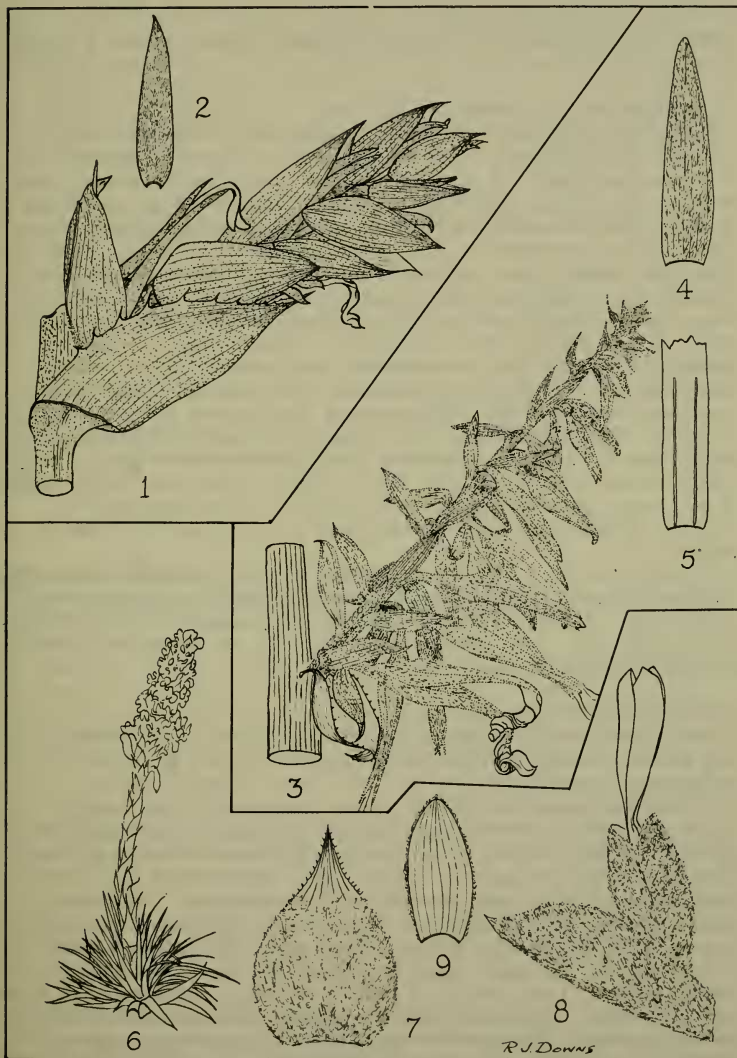


Fig. 1, 2: *Puya tovariana*; fig. 3-5: *P. alba*;
fig. 6-9: *P. ctenorhyncha*.

on Cerro Campana, Province of Trujillo, Department of La Libertad, Peru, altitude 550 meters, September 5, 1948, by A. López Miranda (No. 226).

PERU: LA LIBERTAD: Trujillo: On rocks, Cerro Cabras, A. López M. s.n. (US).

PUYA ARANEOSA L. B. Smith, sp. nov.

P. glaucovirens Mez et *P. meziana* Wittm. in systema Mezii proxima sed pedicellis brevibus, sepalis oblongis differt.

Flowering plant 1.5 m. high; leaves (imperfectly known) over 7 dm. long, blades narrowly triangular, 35 mm. wide, glabrous above, covered beneath with fine appressed white scales, laxly serrate with uncinat yellow-brown spines 3 mm. long; scape elongate, about 1 cm. in diameter, soon glabrous; scape-bracts fragile and soon lost; inflorescence bipinnate, lax toward the base, 55 cm. long, slenderly pyramidal, covered with a fine white loose subsistent indument; primary bracts ovate, acuminate, 5 cm. long, subentire, thin, dark brown; racemes (immature) to 13 cm. long, subdense, the sterile naked base 1 cm. long, the apex possibly sterile for a short distance possibly just immature in this specimen; floral bracts elliptic, apiculate, 23 mm. long, entire, thin; pedicels slender, 5 mm. long; sepals oblong, acute, 30 mm. long, ecarinate, thin; petals 5 cm. long, greenish blue. Pl. VI, fig. 7: Leaf-margin x 1; fig. 8: Floral bract and flower x 1; fig. 9: Ventral face of sepal x 1.

Type in the U. S. National Herbarium, No. 2,104,368, collected in scrub forest (monte rigido), near Ahuacha, above Huarochiri, Department of Lima, Peru, altitude 4,000 meters, June 6, 1953, by Emma Cerrate (No. 2049). Duplicate in the Museo de Historia Natural "Javier Prado."

PUYA TOVARIANA L. B. Smith, sp. nov.

Habitus floresque *Puyae roezlii* E. Morr. in animo revocans sed statura minore, bracteis florigeris inermibus sepala subaequantibus differt.

Flowering shoot over 42 cm. high; leaves to 3 dm. long, glabrous above, covered beneath with pale gray appressed scales; sheaths broadly ovate, 3 cm. long, serrulate toward the apex; blades narrowly triangular, acuminate, pungent, 18 mm. wide, laxly serrate with pale slender ascending spines 3 mm. long; scape about 5 mm. in diameter, stellate-lepidote; scape-bracts erect, like the leaves but with much smaller blades and with larger spines on their sheaths; inflorescence bipinnate, subcylindric, 3 dm. long, 14 cm. in diameter, covered with fine white stellate trichomes, lax toward the base; primary bracts broadly ovate, apiculate or the lowest short-caudate, about half as long as the branches, pectinate-serrate; branches spreading-recurving with the few flowers somewhat downwardly second, slender, geniculate; floral bracts ovate, acute, ecarinate, to 25 mm. long, about equaling the mature sepals, entire or very obscurely dentate, thin, rose; pedicels obconic,

5 mm. long; sepals lance-oblong, acute, 20 mm. long, thin; petals 35 mm. long, dark green. Pl. VII, fig. 1: Branch of inflorescence x 1; fig. 2: Sepal x 1.

Type in the U. S. National Herbarium, No. 2,104,366, collected in deciduous forest (monte pluviifolio), at Aisha, below Huarochiri, Province of Huarochiri, Department of Lima, Peru, altitude 3,180 meters, May 11, 1953, by Emma Cerrate and Oscar Tovar (No. 1831). Duplicate in the Museo de Historia Natural "Javier Prado."

TILLANDSIA DEPPEANA Steud. var. TRIPINNATA L. B. Smith, var. nov.

A var. deppeana inflorescentia ample tripinnatim paniculata differt.

Inflorescence amply tripinnate; sterile bases of the branches to 15 cm. long, densely bracteate; spikes lanceolate, 11 cm. long, 3 cm. wide, strongly complanate; floral bracts oblong, 3 cm. long.

Type in the U. S. National Herbarium, No. 2,104,349, collected in subtropical forest, below Carpish, between Huánuco and Tingo María, Province of Huánuco, Department of Huánuco, Peru, altitude 2,300-2,400 meters, June 23, 1953, by R. Ferreyra (No. 9410). Duplicate in the Museo de Historia Natural "Javier Prado."

BOLIVIA

PUYA ALBA L. B. Smith, sp. nov.

P. violacea (Brongn.) Mez et P. hauthalii Mez in systema Mezii proxima sed inflorescentia albo-flocculosa, petalis albis differt.

Plant 2 m. high; leaves and scape unknown; inflorescence laxly bipinnate, persistently white-flocculose; primary bracts sub-orbicular, apiculate, 3 cm. long, densely serrate; branches divergent, 15 cm. long, subdense with downwardly second flowers; floral bracts elliptic, acute, about equaling the pedicels, entire, subcoriaceous; pedicels slender, to 25 mm. long; sepals narrowly lanceolate, acute, 30 mm. long, ecarinate; petals over 5 cm. long, white, bearing 2 long vertical calli near the base. Pl. VII, fig. 3: Branch of inflorescence x 1/2; fig. 4: Sepal x 1; fig. 5: Base of petal x 1.

Type in the U. S. National Herbarium, No. 2,104,004, collected on rocky slopes, near Palos Blancos, Department of Tarija, Bolivia, altitude 800 meters, March 1952, by M. Cárdenas (No. 4952-a).

PUYA CTENORHYNCHA L. B. Smith, sp. nov.

A P. fastuosa Mez, cui affinis, statura minore, bracteis primariis ad apicem versus pectinato-serratis differt.

Plant 1.2 m. high; leaves over 5 dm. long, glabrous above, covered beneath with appressed gray scales; sheaths suborbicular, 7 cm. long; blades narrowly triangular, 35 mm. wide, laxly serrate with red-brown spines 4 mm. long; scape stout, white-

lanate; scape-bracts erect and exceeding the internodes but only partially covering the scape, broadly ovate with small subfoliaceous blades, very dark brown, subcoriaceous when dry, persistent, serrate, floccose; inflorescence very densely bipinnate, fusiform, 3 dm. long, 8 cm. in diameter, densely white-floccose; primary bracts like the scape-bracts but their narrowly triangular apices notably pectinate-serrate and not at all foliaceous, 6 cm. long, equaling or exceeding the globose few-flowered spikes; floral bracts elliptic, apiculate, 35 mm. long, exceeding the sepals; pedicels 7 mm. long, rather slender; sepals elliptic, broadly acute, 20 mm. long, coriaceous; petals naked, 4 cm. long, light yellow-green. Pl. VII, fig. 6: Habit after photo; fig. 7: Primary bract x 1/2; fig. 8: Floral bract and flower x 1; fig. 9: Ventral face of sepal x 1.

Type in the U. S. National Herbarium, No. 2,103,952, collected on rocky slopes, Anilaya-Larecaja, Department of La Paz, Bolivia, altitude 3,500 meters, April 1951, by M. Cárdenas (No. 4867).

AN ABNORMAL FORM OF SPRING-BEAUTY

Fred W. Oswald

The abnormal form of spring-beauty (Claytonia virginica), illustrated here in figure "A", differs from the usual type "B" in possessing one or two leaf-like bracts near the base of the loose raceme of flowers. These bracts, when two do occur upon one plant, are not arranged in opposite fashion. Two minor, abortive petals occur between the two sepals, one upon each side and noticeable only when the blossoms are closed.

This strange form was observed continuously by me for a period of three years among a colony of about a dozen plants, and each spring appearing exactly alike.

Specimens used for making the sketches were collected by Fred W. Oswald on April 12, 1954, about 1 1/2 tenths of a mile north of Route 4 and 3/10 of a mile east of Forest Avenue, Paramus, Bergen County, New Jersey.